



The Honorable  
Christopher A. Hart  
Acting Chairman

# NTSB 101

- Independent federal agency that investigates transportation accidents and incidents, all modes
  - Aviation
  - Highway
  - Rail
  - Marine (NTSB or Coast Guard)
  - Pipeline
- Determine probable cause(s) and make recommendations to prevent recurrences
  - Do not determine blame or liability



# Other NTSB Activities

- Conduct special studies and investigations
  - Review troubling trends
  - Make recommendations to address trends
- Assist victims and their families
  - Extensive assistance, first few days
  - Longer term, further assistance upon request



# Independent

- 5 Members
  - Nominated by President, confirmed by Senate
- Political independence
  - Political party balance
  - Member terms are fixed and staggered
  - Requirement for relevant background, expertise
  - Purpose: Conclusions from facts, not politics
- Functional Independence
  - Not a regulator or operator
  - Purpose: Impartial and unbiased investigations



# Purpose

- Single focus is *SAFETY*
- Primary product:  
Safety recommendations
- Not a regulator, can only recommend



# Recommendations

- Safety recommendations are issued to any organization that has authority to address the problem, including operators, manufacturers, regulators (U.S. and foreign), labor unions, trade associations, and state and local governments
- Response to recommendations:
  - > 80% acceptable



# Major Railroad Issues

- Positive Train Control
- Crude oil, ethanol, by rail
- Fatigue
- Distraction



# Positive Train Control

- People are part of the system
- People make errors due to:
  - Fatigue/sleeping disorders
  - Use of medication
  - Loss of situational awareness
  - Distractions (e.g., cell phones)
  - Other
- PTC provides a backup to human error





# PTC Preventable Accidents

- Since 1969, the NTSB has issued PTC related recommendations in dozens of collision investigations
- Several additional collision investigations noted the lack of PTC in the probable cause
- PTC has been on the NTSB's MWL nearly every year since its inception in 1990



# Crude Oil, Ethanol, by Rail

- New business model developed quickly
- Regulatory machinery can't keep pace
- Much emphasis on tank car integrity, but need holistic approach
  - Most important: Prevent derailment
  - Tank car integrity
  - Emergency response



# Challenges of Fatigue

- Underlying science not well developed – more than just sleep deprivation
- Difficult to measure
  - Initially
  - Degradation while underway
  - Post-accident
- One size may not fit all
  - At work: Depends upon shift, duties, environment, many other factors
  - Not at work: Can't regulate activities, lifestyle
- How to assure coming to work well rested?



# Obstructive Sleep Apnea

- Increasing problem as BMI increases
- Lack of awareness
- Falling asleep or fatigue-related decrements in performance
- Up to 7-fold increase in risk of motor vehicle accident



# Good News – It's Treatable

- Treatment with CPAP (titration)
  - Many cognitive deficits reversible
  - Canadian study → reduced risk of accident
- Operational experience
  - Large trucking company
  - Instituted screening/diagnosis/treatment
  - Reported reduced accidents, reduced health care costs, increased driver retention



# Sample OSA Accident

- Clarkston, MI – November, 2001
- Southbound train proceeded through stop signal from a siding, 13 mph
- Northbound train at 30 mph
- 2 crew killed; 2 injured
- OSA was diagnosed or suspected in both southbound crew



# Accident (con't)

- Engineer (5'11" and 262 lbs – BMI 36.5):
  - Uncontrolled diabetes
  - Sleep study recommended by MD, ENT
- Conductor: diabetes, depression
  - Sleep study 5 yrs prior – AHI 89
  - CPAP, no titration, persistent snoring, somnolence
- Probable cause:
  - The crewmembers' fatigue, which was primarily due to the engineer's untreated and the conductor's insufficiently treated obstructive sleep apnea



# Recommendations

- NTSB made recommendations separately to all modal transportation administrations (FAA, FMCSA, FRA, FTA, plus USCG), starting 2001
- NTSB generally recommended:
  - Identify diagnosis or risk factors for OSA
  - Screening programs and treatment
  - Guidance for operators, employers and physicians
  - Emphasize that employees who are treated routinely return to work





# Distraction

- Distraction can come from variety of sources
- Rapidly increasing distraction from personal electronic devices, increasingly prevalent
- Difficult to ensure non-use
- Fatal PED accidents in every mode



# Chatsworth, 2008

- Engineer of commuter train texting
- Previously warned re texting
- Passed red (Stop) signal
- Collided with oncoming freight train, 25 fatalities (including engineer)
- NTSB recommended in-cab camera



# Overarching Issues

- Safety Management Systems
- Professionalism
- When all else fails, Positive Train Control



Thank You

***Questions?***



National Transportation Safety Board